

VARIABLE MAGNETIC RESISTANCE UNIT FOR AN EXERCISE DEVICE  
ABSTRACT OF THE DISCLOSURE

An automatically adjusting magnetic resistance unit for an exercise device such as a bicycle trainer, in which the degree of resistance is automatically and non-linearly adjusted in relation to the rotational speed of a rotating member caused by the input of a user. The rotating member may be in the form of a flywheel having a number of supports extending between a hub and a rim. The supports define longitudinal grooves which slidably retain magnets that are biased inwardly toward the hub by biasing members. An electrically conductive member is located adjacent the flywheel.

As the flywheel rotates in response to rotation of the bicycle wheel, the magnets interact with the conductive member to establish eddy currents that provide resistance to the rotation of the flywheel. The speed of rotation of the flywheel increases as the speed of rotation of the bicycle wheel increases, and centrifugal forces act on the magnets to cause the magnets to slide outwardly along the grooves in opposition to the bias of the biasing members. The outward movement of the magnets causes outward movement of the eddy current forces, to increase the resistance provided to rotation of the flywheel and the bicycle wheel. The variable resistance due to the increased or decreased rotational speed of the flywheel is smooth, based on the constant interaction of the counteracting forces of the biasing members and the centrifugal forces acting on the magnets.